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ULTRASHORT PULSE MULTICHANNEL INFRARED SPECTROMETER APPARATUS AND METHOD FOR OBTAINING ULTRAFAST TIME RESOLUTION SPECTRAL DATA

Abstract

A simple, compact optical spectrometer employs solid-state nonlinear crystals for obtaining broadband multichannel infrared spectra with picosecond or femtosecond time resolution. Spectrally broad infrared pulses are produced by difference frequency mixing in a first $LiIO_3$ crystal between the second harmonic of a picosecond Nd^{+3} :YAG laser and broadband output of a synchronously pumped dye laser, and a resultant broadband IR pulse is upconverted by a second $LiIO_3$ crystal to yield a blue visible pulse which is dispersed by a 0.25 meter spectrograph onto a multichannel vidicon or reticon detector to obtain four wave-number resolution single-shot transient infrared spectra of a sample. The present invention enables rapid acquisition of ultrashort time infrared spectra over a broadly tunable spectral range (in the mid to near infrared) at minimal cost and by a simple but versatile optical system employing readily available components.

Inventors

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References

- Expired U.S. Patent # 4,980,566 expired 08/02/2009
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Status of Availability

This technology is available in the public domain.

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